TSGS#25(04)0542

Source: **SA5 (Telecom Management)**

Title: **Rel-6 CR 32.421 Removal of GERAN from Rel-6 32.42x series of Trace specifications**

Document for: **Approval**

Agenda Item: **7.5.3**

Doc-1st-Level	Doc-2nd-Level	Spec	CR	Rev	Phase	Subject	Cat	Ver-Cur	Wi
SP-040542	S5-042534	32.421	004	--	Rel-6	Removal of GERAN from Rel-6 32.42x series of Trace specifications	F	6.3.0	OAM-Trace

CR-Form-v7

CHANGE REQUEST

⌘	32.421	CR	004	⌘	rev	-	⌘	Current version:	6.3.0	⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network X Core Network X

Title:	⌘	Removal of GERAN from Rel-6 32.42x series of Trace specifications
Source:	⌘	**SA5** (kari.t.ronka@nokia.com)
Work item code:	⌘	OAM-Trace
Date:	⌘	18/08/2004
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	By agreement of SA5, GERAN has been removed from the scope of 32.42x series of specifications for Trace in Rel-6.
Summary of change:	⌘	Remove all GERAN related text from Rel-6 TS 32.421 ìTrace Concepts and Requirementsî.
Consequences if not approved:	⌘	TS 32.421 is not in alignment with SA5 agreements and not with Rel-6 TSs 32.422 ìTrace control and configuration managementî and 32.423 ìTrace data definition and managementî.

Clauses affected:	⌘	5.2, 5.3, Annex A

		Y	N		
Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	

How to create CRs using this form:

Change in Clause 5.2

5.2 Requirements for Trace data

The high level requirements for Trace data, common to both Management activation/deactivation and Signalling based activation/deactivation, are as follows:

- The Trace records have to contain Information Elements or signalling messages from control signalling and/or the characteristics of the user data. The following list contains the Network Elements and the Traceable interfaces in the NEs where tracing is needed:
  - MSC Server: A, Iu-CS, Mc and MAP (G, B, E, F) interfaces;
  - MGW: ATM, IP and TDM interfaces for user plane characteristics;
  - HSS: MAP (C, D, Gc, Gr) and Cx interfaces and location and subscription information;
  - SGSN: Gb, Iu-PS, Gn, MAP (Gr, Gd, Gf), CAP (Ge) and Gs interfaces;
  - GGSN: Gn and Gi interfaces;
  - S-CSCF: Mw, Mg, Mr and Mi interfaces;
  - P-CSCF: Gm and Go interfaces;
  - RNC: Iu-CS, Iu-PS, Iur, Iub and Uu interfaces;
  - ~~BSC: Iu-CS, Iu-PS, Um, Abis, A and Gb interfaces.~~
- A unique ID within a Trace Session shall be generated for each Trace Recording Session. This is called the Trace Recording Session Reference.

Changes to existing NEs and interfaces above may be required. These changes would be dependent upon various 3GPP working groups and possibly other non-3GPP industry groups for completion of Trace Session activation/deactivation.

For a detailed description of network elements and interfaces above see 3GPP TS 23.002 [4].

End of change in Clause 5.2

Change in Clause 5.3

5.3 Requirements for Trace activation

5.3.1 Requirements for Trace Session activation

The high level requirements for Trace Session activation, common to both Management activation and Signalling based activation), are as follows:

- In case of subscriber Trace, the Trace Session will be activated for a certain subscriber whose identification (IMSI in UTRAN/~~GERAN/~~CS/PS or Private ID in IMS) shall be known in the NEs where subscriber Trace is needed.

End of change in Clause 5.3

Changes in Annex A

Annex A (informative): Trace use cases

A.1 Use case #1: multi-vendor MS validation

A.1.1 Description

The aim of this use case is to check how different vendor's MSs are working (e.g. in field testing) in the mobile network or to get detailed information on the MS.

The study can be started by an initiative from operator for verification of MS from different vendors (e.g. testing how the MS fulfils the requirements set by the standards).

The operator can perform the test using test MSs or tracing subscribers' mobiles.

A.1.2 Example of required data for this use case

The Trace parameters required to cover use case #1 are listed below:

- Tracing is needed in the Radio Network (~~BSC/~~RNC) or in the Core Network (MSS, SGSN);
- The identification of the Trace case shall be IMEI or IMEISV (and possibly IMSI);
- The level of details usually is to get the most important IEs from the signalling messages (Medium Level) or all messages with their encoded IEs (Maximum Level).

The traceable protocols are:

~~In BSC: RR.~~

- In RNC: RRC, NBAP, RNSAP, RANAP.
- In MSS/SGSN: DTAP messages.

A.2 Use case #2: subscriber complaint

A.2.1 Description

The aim of this use case is to check how the complaining subscriber's services are working, to get information on the services in order to find out the reason for the complaint.

The study can be started after a subscriber is complaining at his/her home or visited operator that some of the service to which he/she subscribed is not working. E.g. the subscriber:

- cannot make calls;
- cannot use some supplementary service;
- does not get the negotiated QoS level (e.g. Mobile subscriber activates video-streaming application to watch the latest sport events and every time the subscriber tries to connect to the service the system disconnects the subscriber's UMTS bearer).

As the Trace is activated for a subscriber, the signalling based Trace Session activation shall be used, as the location of the subscriber is not known.

A.2.2 Example of required data for this use case

The Trace parameters required to cover the use case #2 are listed below:

- The list of NEs where tracing may be needed depends on the service being complained about by the subscriber. For this use case, tracing should be possible in all network elements, such as: HSS, MSS, ~~BSC,~~ RNC, MGW, SGSN, GGSN, S-CSCF, P-CSCF.

- The identification of the subscriber in a Trace is IMSI in UTRAN~~/GERAN~~/CS/PS or Private ID in IMS. The identification of the MS in a Trace is IMEI or IMEISV.

- The data includes those Information Elements from the signalling messages, which are related to the service(s) being complained about by the subscriber (Medium Level).

Example cases, which can be the basis for subscriber complaint:

1. The subscriber cannot make an IM session.

   Tracing is needed in HSS, S-CSCF, P-CSCF, SGSN, GGSN and UTRAN. The subscriber identification for this case is Private ID in IMS and IMSI in PS domain. From the HSS Trace the operator can determine whether the service in question or IM session establishment is allowed for the subscriber. From the S-CSCF and P-CSCF Trace the operator can examine the SIP signalling together with the SDP, which contains information on the media, while in the P-CSCF Trace the QoS negotiation with GGSN can be determined so in P-CSCF the COPS messages should be traced. From COPS (see 3GPP TS 29.207 [6] for more information on COPS) those parameters are needed, which show how the QoS Policy control is working, whether the session was dropped due to the QoS negotiation. If the source of the complaint is not found in IMS, tracing in SGSN, GGSN and in UTRAN is needed. From SGSN Trace record the QoS parameters, PDP contexts related information can be known while from UTRAN Trace information on the radio coverage and also some QoS related information can be known.

2. The subscriber's CS call is misrouted

   This illustrates an instance where a subscriber complains that his calls are being cross-connected (or misrouted). Such a complaint involves setting up a Trace at all the 3GPP standardised interfaces being handled by the MSC. However, the Trace functionality shall not cover MSC internal or vendor proprietary interfaces. The Trace record shall need to have the dialled number and connected number.

3. The subscriber's call is dropped

   Tracing data is required from the radio network (UTRAN~~/GERAN~~) or from the core network (MSS, SGSN, GGSN). In the radio network the radio coverage shall be checked. See use case #4 (checking radio coverage). Beside the radio coverage, other information can be useful as well, like RLC parameter, power information (OLPC or RRC measurement report), error ratios (BLER / BER, SDU error ratio), etc. Tracing in the core network is needed also, if the problem is not in the radio network. E.g. in case of PS domain the call can be dropped by the application due to the long delays or congestions in TCP layer or due to bad QoS. Thus in SGSN the requested and negotiated QoS parameters should be included in the Trace record.

4. The received QoS level is less than the negotiated level.

   To be able to solve the possible problem Tracing data is required from HSS, SGSN, GGSN, and UTRAN~~, and GERAN~~. Furthermore in case of problem in CS calls tracing in MGW shall be performed.

   From HSS Trace data the operator can monitor whether the subscriber's authentication to the network is successful, and what kind of QoS parameters are allowed to the subscriber. From SGSN Trace data the operator can monitor PDP context creation request from mobile. Request seem to contain legal QoS profile (incl. Maximum bandwidth, guaranteed bandwidth etc) and the local resources in SGSN are available to provide the service as requested by the subscriber. From UTRAN~~/GERAN~~ Trace data the operator can monitor whether the maximum bandwidth and guaranteed bandwidth, requested by SGSN, acceptable for UTRAN~~/GERAN~~. Thus to check whether UTRAN~~/GERAN~~ can provide and maintain the requested radio access bearer services. From GGSN Trace data the operator can monitor PDP context activation between SGSN and GGSN. If the problem is in the CS domain the MGW Trace can provide the QoS data.

A.3 Use case #3: malfunctioning MS

A.3.1 Description

The aim of this use case is to check a MS, which is not working correctly.

The study can be initiated by the operator when he/she suspects that a MS not working according to the specifications or he/she would like to get more information on a specific MS, which is on the grey or black EIR list.

A.3.2 Example of required data for this use case

The Trace parameters required to cover the use case #3 are listed below:

- MS Tracing may be needed in the Radio Network (UTRAN~~/GERAN~~) or in the Core Network (MSS, SGSN).
- The identification of the subscriber in a Trace is IMSI. The identification of the MS in a Trace is IMEI or IMEISV.
- The level of details depends on the operator needs (either Minimum Level or Medium Level).

The malfunction of MS in UTRAN~~/GERAN~~ can occur in different places. The problem can be in basic RRC and RANAP signalling, Radio Bearer procedures, Handover procedures, Power control etc.

Therefore, all RRC, RANAP, NBAP, RNSAP signalling procedures, transmission powers, error ratios (BLER / BER, SDU error ratio) and retransmission can be included in the Trace records.

A.4 Use case #4: checking radio coverage

A.4.1 Description

This use case aims at checking the radio coverage on a particular network area.

This study can be started by an initiative from operator for testing radio coverage on a particular geographical area following network extension for instance (e.g. new site installation).

The operator can perform a drive test on the new site area, and check that radio coverage is correct.

A.4.2 Example of required data to cover use case #4

The DL radio coverage can be checked using the values of CPICH Ec/No and RSCP measured by the mobile on the cells in the active set and the monitored set. These measurements are sent to the RNC trough the RRC message MEASUREMENT REPORT.

The UTRAN Trace record intra frequency measurement contains the required information.

The UTRAN Trace record inter frequency, and inter RAT measurements can also be used to check radio coverage with other frequencies or systems.

After a network extension, the operator can check that Ec/No and RSCP levels on the new site area are the expected ones, and there is no coverage hole.

The following Trace parameters are required to cover use case #4:

- The type of NE to Trace is RNC.
- The identification of the subscriber in a Trace is IMSI. The identification of the MS in a Trace is IMEI or IMEISV.

- The Trace data to retrieve shall contain the messages with all IEs that are relevant for radio coverage.

A.5 Use case #5: testing a new feature

A.5.1 Description

This use case aims at testing the implementation of a new feature in the network before its general deployment. The functionality can be either a standard feature or a vendor/operator specific feature.

This study is started by an initiative from the operator.

The operator can perform a drive test on the area where the feature is introduced, and check its good behaviour as well as its benefits, in term of quality or capacity. He can also rely on subscribers' Trace data when they use the feature to be tested.

A.5.2 Example of required data to cover use case #5

Depending on the feature, the list of NEs to Trace, as well as the level of details can be different.

For a feature concerning Core~~,~~ and UTRAN ~~and GERAN~~ networks, for instance hard handover, SRNS relocation, or new UMTS bearer service, the operator needs to activate Trace on several NEs.

Then, the operator can be interested in:

- Only the protocol messages generated by the feature; or
- The impact of the new feature introduction on the network, for instance, the radio coverage, the capacity, the quality, or the behaviour of the existing algorithms.

In this last case, the operator needs more detailed data, for instance messages with all (Maximum Level) or part of the IEs (Minimum Level).

The following Trace parameters are required to cover use case #5:

- The types of NEs to Trace are NEs that can be traced related to the feature.
- The identification of the subscriber in a Trace is IMSI. The identification of the MS in a Trace is IMEI or IMEISV.
- The Trace data to retrieve can be either only the protocol messages (Maximum Level) or the messages with all or part of the IEs (Minimum Level).

End of Change in Annex A
End of Document

Annex B (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
Jun 2002	S_16	SP-020330	--	--	Submitted to SA #16 for Information	1.0.0	
Dec 2002	S_18	SP-020755	--	--	Submitted to SA #18 for Approval	2.0.0	6.0.0
Mar 2003	S_19	SP-030147	001	--	Corrections to Trace requirements - Align with SA2's 23.002	6.0.0	6.1.0
Dec 2003	S_22	SP-030612	002	--	Correction of IMS subscriber identification for Trace	6.1.0	6.2.0
Mar 2004	S_23	SP-040116	003	--	Correction in Trace high level architecture	6.2.0	6.3.0